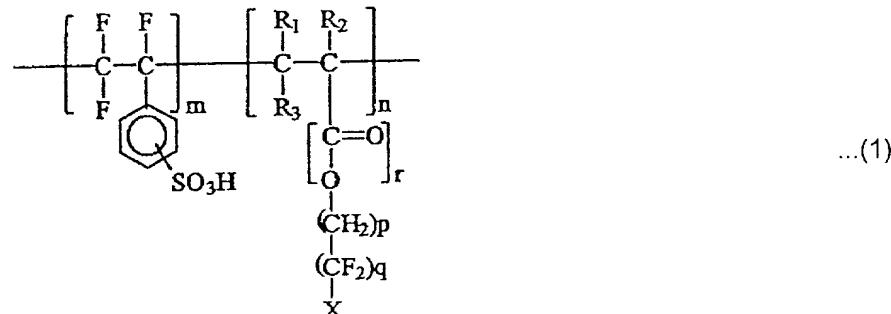


What is claimed is:

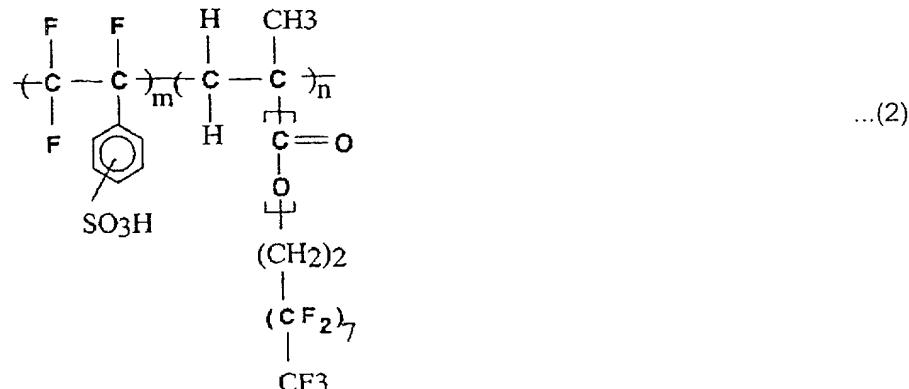
1. A partially fluorinated copolymer having formula (1):



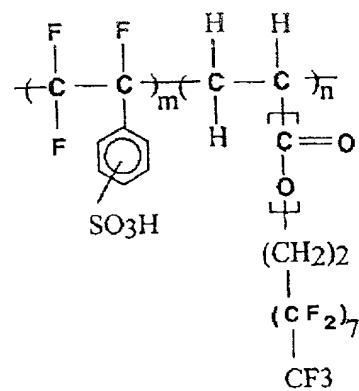
14 wherein each of R_1 , R_2 and R_3 independently is selected from the group consisting
15 of F, H and CH_3 ; X is a hydroxy group or a trifluoromethyl group; m is an integer
16 greater than zero; n is an integer greater than zero; and p, q and r are zero or
17 integers greater than zero.

1. The partially fluorinated copolymer of claim 1, wherein, in formula (1),
2 m is an integer from 1 to 50, n is an integer from 1 to 50; p is zero or an integer from
3 1 to 12; and q is zero or an integer from 1 to 12.

1. The partially fluorinated copolymer of claim 1, wherein the partially
2 fluorinated copolymer having formula (1) is a compound having one selected from
3 formulas (2) to (5):



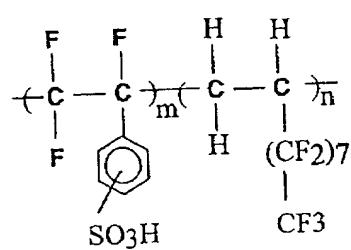
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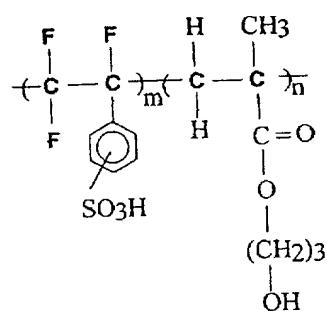
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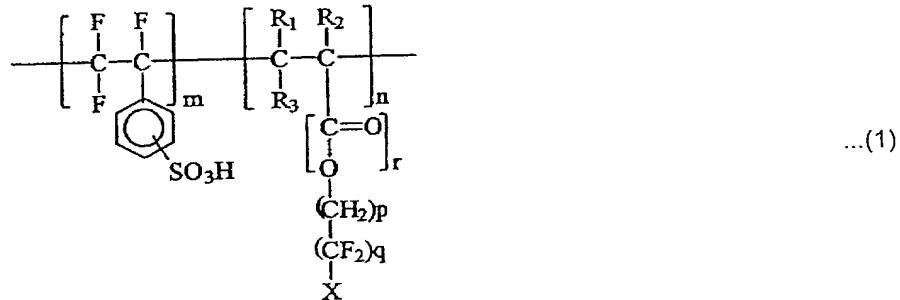
50 where m is an integer from 1 to 50; and n is an integer from 1 to 50.

1 4. The partially fluorinated copolymer of claim 1, wherein the partially
2 fluorinated copolymer having formula (1) has a weight average molecular weight of
3 about 30,000 to about 500,000.

1 5. The partially fluorinated copolymer of claim 1, wherein the partially
2 fluorinated copolymer is partially crosslinked using a crosslinking agent.

1 6. The partially fluorinated copolymer of claim 5, wherein the crosslinking
2 agent comprises at least one selected from the group consisting of divinyl benzene,
3 diallyl ether, triallyl ether, diglycidyl ether and ethylene glycol dimethacrylate.

1 7. An ionic conductive polymer membrane comprising a partially
2 fluorinated copolymer having formula (1):

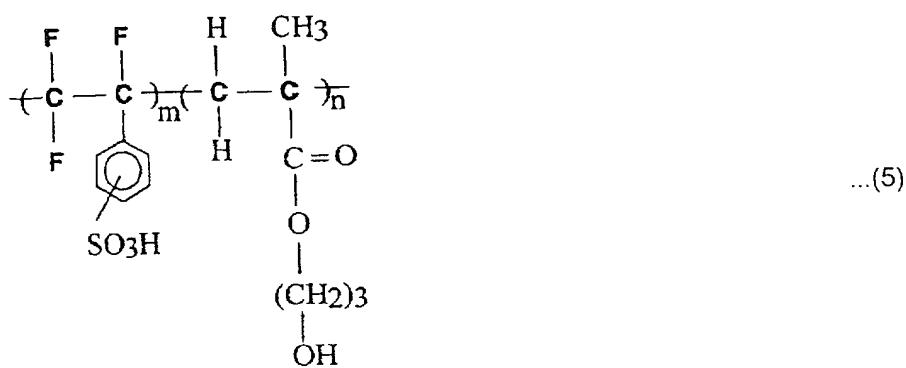
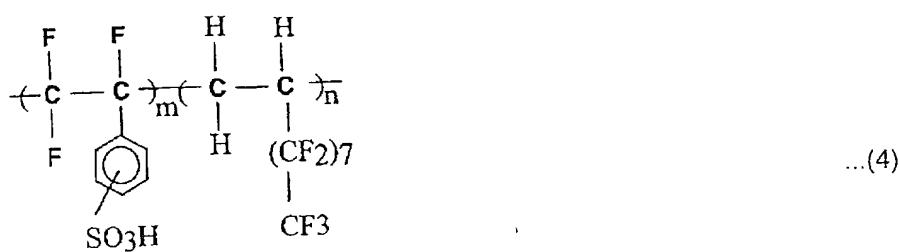
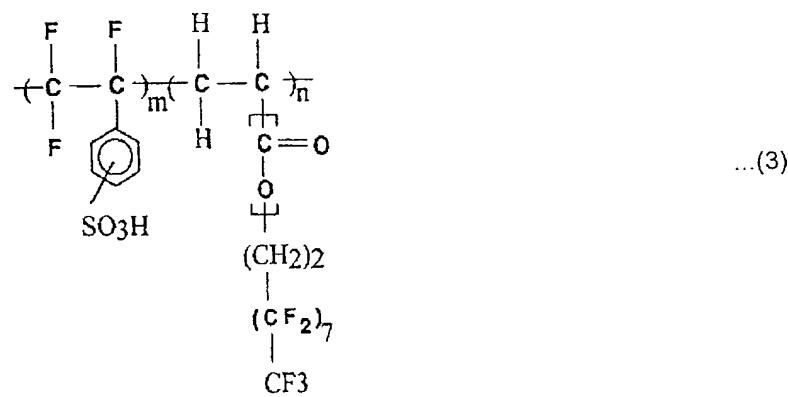
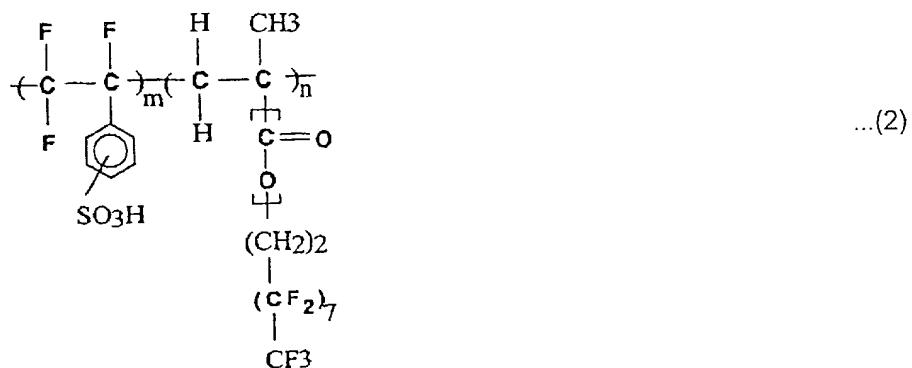


1 wherein each of R_1 , R_2 and R_3 independently is selected from the group consisting
2 of F, H and CH_3 ; X is a hydroxy group or a trifluoromethyl group; m is an integer
3 greater than zero; n is an integer greater than zero; and p , q and r are zero or
4 integers greater than zero.

1 8. The ionic conductive polymer membrane of claim 7, wherein, in
2 formula (1), m is an integer from 1 to 50, n is an integer from 1 to 50; p is zero or an
3 integer from 1 to 12; and q is zero or an integer from 1 to 12.

1 9. The ionic conductive polymer membrane of claim 7, wherein the

2 partially fluorinated copolymer having formula (1) is a compound having one
3 selected from formulas (2) to (5):



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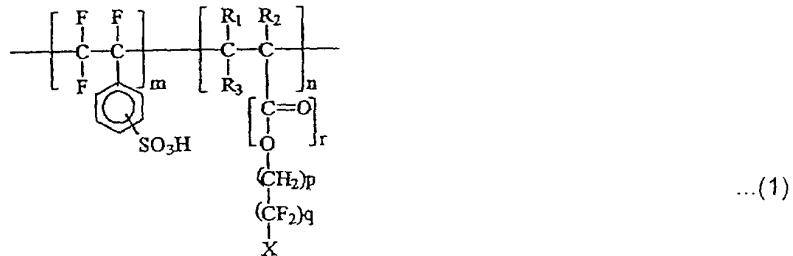
42 where m is an integer from 1 to 50; and n is an integer from 1 to 50.

1 10. The ionic conductive polymer membrane of claim 7, wherein the
2 partially fluorinated copolymer having formula (1) has a weight average molecular
3 weight of about 30,000 to about 500,000.

1 11. The ionic conductive polymer membrane of claim 7, wherein the
2 partially fluorinated copolymer is partially crosslinked using a crosslinking agent.

1 12. The ionic conductive polymer membrane of claim 5, wherein the
2 crosslinking agent comprises at least one selected from the group consisting of
3 divinyl benzene, diallyl ether, triallyl ether, diglycidyl ether and ethylene glycol
4 dimethacrylate.

1 13. A fuel cell comprising an ionic conductive layer, the layer comprising a
2 partially fluorinated copolymer having formula (1):

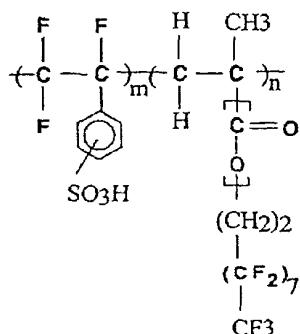


13 wherein each of R₁, R₂ and R₃ independently is selected from the group consisting
14 of F, H and CH₃; X is a hydroxy group or a trifluoromethyl group; m is an integer
15 greater than zero; n is an integer greater than zero; and p, q and r are zero or
16 integers greater than zero.

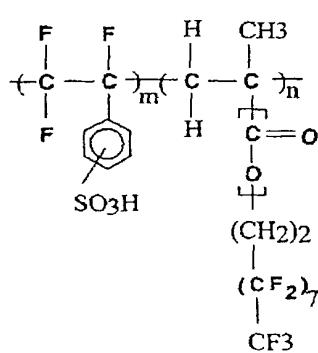
14. The fuel cell of claim 13, wherein, in formula (1), m is an integer from 1

2 to 50, n is an integer from 1 to 50; p is zero or an integer from 1 to 12; and q is zero
3 or an integer from 1 to 12.

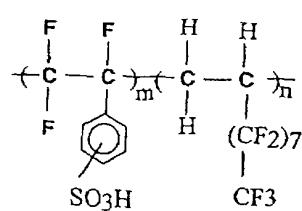
15. The fuel cell of claim 13, wherein the partially fluorinated copolymer
having formula (1) is a compound having one selected from formulas (2) to (5):



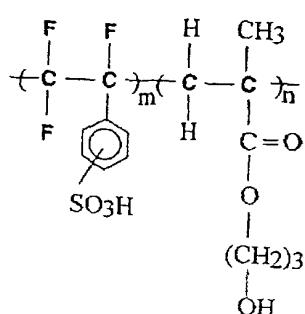
... (2)



... (3)



... (4)



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41 where m is an integer from 1 to 50; and n is an integer from 1 to 50.

1 16. The fuel cell of claim 13, wherein the partially fluorinated copolymer
2 having formula (1) has a weight average molecular weight of about 30,000 to about
3 500,000.

1 17. The fuel cell of claim 13, wherein the partially fluorinated copolymer is
2 partially crosslinked using a crosslinking agent.

18. The fuel cell of claim 17, wherein the crosslinking agent comprises at least one selected from the group consisting of divinyl benzene, diallyl ether, triallyl ether, diglycidyl ether and ethylene glycol dimethacrylate.